Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIDETSUGU TANAKA, YOSHIO YAMAMOTO, YOSHINAO HARADA, and TAKAO CHIKAZAWA

Appeal No. 2002-1385
Application No. 09/049,861

ON BRIEF

Before BARRETT, RUGGIERO, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 5-12, which are all the claims remaining in the application.

We affirm-in-part.

BACKGROUND

The invention is directed to a magnetic disk storage medium and a disk drive which reduces friction between the head/slider and the disk. The landing zone for the head/slider is comprised of an untextured area and a textured area for reducing sticking of the head/slider to the disk surface when starting or landing the head/slider. Claim 5 is reproduced below.

5. A disk drive comprising:

a head/slider having an air bearing surface for floating a slider over a rotating disk;

the disk having a disk substrate, a storage medium on at least a portion of a surface of the disk, the storage medium having a storage area for recording data, the disk having a circumferential landing zone on an area of the disk other than said storage area, the circumferential landing zone being partially textured;

the landing zone having a texture free zone which faces a minimum fly height area of the air bearing surface of the slider when the slider is landing and also having a circumferential bump zone adjacent to said free zone, the bump zone being formed with bumps protruding from the surface of said disk, the free zone having no bumps; and

a landing position control unit for moving the slider so that the minimum fly height area of said slider is positioned over the free zone of said disk storage medium when landing said slider.

The examiner relies on the following references:

Samoto (Japanese Published Application)[1]	4-38716	Feb. 7, 1992
Sato et al. (Sato) (Japanese Published Application)	5-307748	Nov. 19, 1993
Ishihara et al. (Ishihara) (Japanese Published Application)	6-111294	Apr. 22, 1994
Matsumura et al. (Matsumura) (Japanese Published Application)	6-290452	Oct. 18, 1994

Claims 5 and 9 stand rejected under 35 U.S.C. § 102 as being anticipated by Ishihara or Matsumura.

Claims 5, 7-9, and 11 stand rejected under 35 U.S.C. § 102 as being anticipated by Sato.

Claims 5-12 stand rejected under 35 U.S.C. § 102 as being anticipated by Samoto.

We refer to the Final Rejection (Paper No. 10) and the Examiner's Answer (Paper No. 13) for a statement of the examiner's position and to the Brief (Paper No. 12) and the Reply Brief (Paper No. 15) for appellants' position with respect to the claims which stand rejected.

[1] The USPTO has provided an English translation for each of the four applied references.

OPINION

Although appellants appear to submit that each claim is separately patentable (Brief at 4), we will select representative claims in accordance with the separate arguments presented. See 37 CFR § 1.192(c)(7).

At the outset, we note our agreement with appellants to the extent that the instant rejections are based on a claim interpretation (e.g., Final Rejection at 3) whereby the instant claims may be met by a landing zone comprised of bumps and areas between the bumps. With respect to instant claim 5, the applicable definition of a "zone" is "a region or area set off as distinct from surrounding or adjoining parts." Webster's Ninth New Collegiate Dictionary at 1372 (1990). Instant claim 9 recites "a textured area and an untextured area" which, in our view, clearly sets forth two distinct, exclusive, non-overlapping areas. We agree that three of the four references -- Ishihara, Matsumura, and Sato -- fail to meet the requirements of independent claims 5 and 9 at least because each discloses a landing zone having no more than a single, circumferential textured area.

Samoto, however, discloses a landing zone comprised of distinct textured and untextured areas. We sustain the section 102 rejection of independent claims 5 and 9 over Samoto for the reasons that follow.

Appellants contend that Samoto "teaches the use of concentric or spiral groove [sic] in the landing zone." (Brief at 5.) Appellants further argue that Samoto does not teach a "texture free zone" in conjunction with a "landing position control unit" for

moving the slider so that the minimum fly height area of the slider is positioned over the free zone of the disk storage medium when landing the slider. (Id.)

Samoto discloses, as shown in Figures 1 through 3, an assembly including a magnetic head slider 4 having a slider surface 4c. At rest, the slider surface 4c of the magnetic head slider is press-contacted onto several grooves 8 of the landing zone 3 of the magnetic disk 1 by the spring load of load beam 5. When the magnetic disk 1 is rotated and driven in the direction of arrow b (Fig. 3), air flow is introduced in the arrow d direction into the grooves 8, such that the magnetic disk slider 4 can be floated from landing zone 3. (Samoto translation at 10-11.) As seen in Figures 1 and 2, landing zone 3 contains a texture free zone between two sets of spiral or concentric grooves 8. Because chip 4e is necessarily near the data recording area of the disk during reading from or writing to the disk, we find that the minimum fly height area of the air bearing surface of the slider is at magnetic head chip 4e; i.e., an area where the height between a head/slider and a magnetic disk becomes minimum in the state where the head/slider is floated off the disk. (See appellants' spec. at 10, l. 19 - 11, l. 1.)

We thus disagree with appellants' contention that Samoto fails to teach a "texture free zone" in conjunction with a "landing position control unit" for moving the slider so that the minimum fly height area of the slider is positioned over the free zone of the disk storage medium when landing the slider.

Although appellants do not rely on the limitation, we also note that the Samoto grooves 8 may be considered as relating to a circumferential bump zone adjacent to the

free zone, for all that instant claim 5 requires of the "bump zone." The claim calls for "the bump zone being formed with bumps protruding from the surface of said disk." As best seen in Figure 1 of Samoto, the relatively raised portions of disk 1 between grooves 8 may be fairly considered "bumps protruding from the surface of said disk." The surface of disk 1, from which the bumps protrude, is relatively lower than the surface of the disk at the texture free zone between the sets of grooves 8. Moreover, "the surface of said disk" as set forth in claim 5 merely relates to position with respect to the bumps, since the bumps themselves form the surface of the disk at the locations of the protruding portions of the bumps.

Appellants also contend that claim 9 distinguishes over Samoto in the step of "reducing a rotation rate of the disk to allow a portion of the air bearing surface not having the lowest flying height to contact the textured area of the landing zone first." (Brief at 6.) In view of the rest position of slider 4, shown in Figure 3 of Samoto, we find that a portion of the air bearing surface not having the lowest flying height -- namely, slider surface 4c (Figs. 1 and 3) -- contacts the textured area of the landing zone first. Instant claim 9 is silent as to what the area having the lowest flying height may or may not contact. The claim recites the "untextured area being under an area" on the air bearing surface having a lowest flying height, which is met by Samoto's magnetic head chip 4e being over the untextured area, as shown in Figure 2.

Appellants present arguments in defense of certain dependent claims at page 7 of the Brief. Appellants argue, with respect to claims 6 and 10, that Samoto fails to

teach that the minimum fly height area is on the inner rail. However, the elongated portion of chip 4e, as shown in Samoto's Figure 2, meets the terms of "the inner rail" as claimed.[2] With respect to claims 7 and 11, appellants argue that Samoto fails to teach that the bumps have a height above the surface such that the minimum fly height area of the slider does not touch the surface of the disk during landing. We agree with appellants' assessment. Although we suspect that the minimum fly height area of the slider in Samoto never touches the disk, the reference is silent on the point. Thus, the record lacks evidence sufficient to sustain the rejection of claims 7 and 11. The rejection of claim 12, which incorporates the limitations of claim 11, also cannot be sustained.

CONCLUSION

The rejection of claims 5, 6, and 8-10 under 35 U.S.C. § 102 as being anticipated by Samoto is affirmed. The remainder of the rejections under 35 U.S.C. § 102, including all those applied against claims 7 and 11-12, are reversed.

The examiner's decision in rejecting claims 5-12 is thus affirmed-in-part.

[2] We note that each occurrence of "the minimum fly height area" in claims 10 and 11 lacks proper antecedent basis in the claims.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

LEE E. BARRETT
Administrative Patent Judge

JOSEPH F. RUGGIERO
Administrative Patent Judge

HOWARD B. BLANKENSHIP
Administrative Patent Judge

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